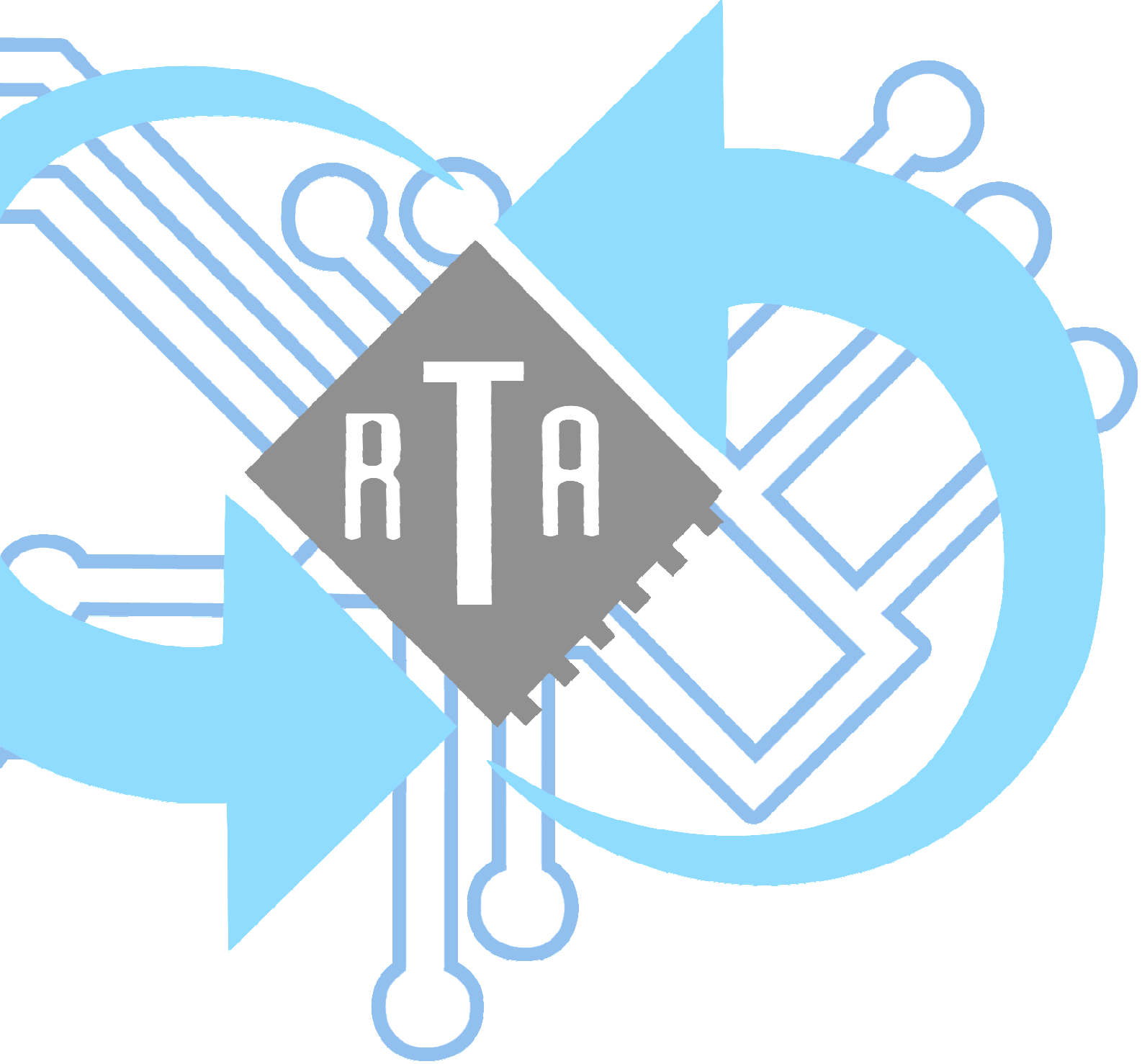

460MXE Gateway

User Guide

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Overview

The 460MXE gateway device seamlessly connects power and energy data between one or more Eaton Power Meters and a BACnet/IP Client or Ethernet/IP Client or DeviceNet Master.

By following this guide, you will be able to configure the 460MXE gateway for basic operation. You will set the device's network settings and parameters to the proper configuration for initial operation and physically place the device in the network.

For further customization and advanced use contact support at Real Time Automation..

Required Tools and Data

You will need the following tools:

- The 460MXE Gateway
- The provided CD-ROM
- A Working PC (Windows based)
- The Supplied Ethernet crossover cable
- A 7-30 VDC power source (T-strip)

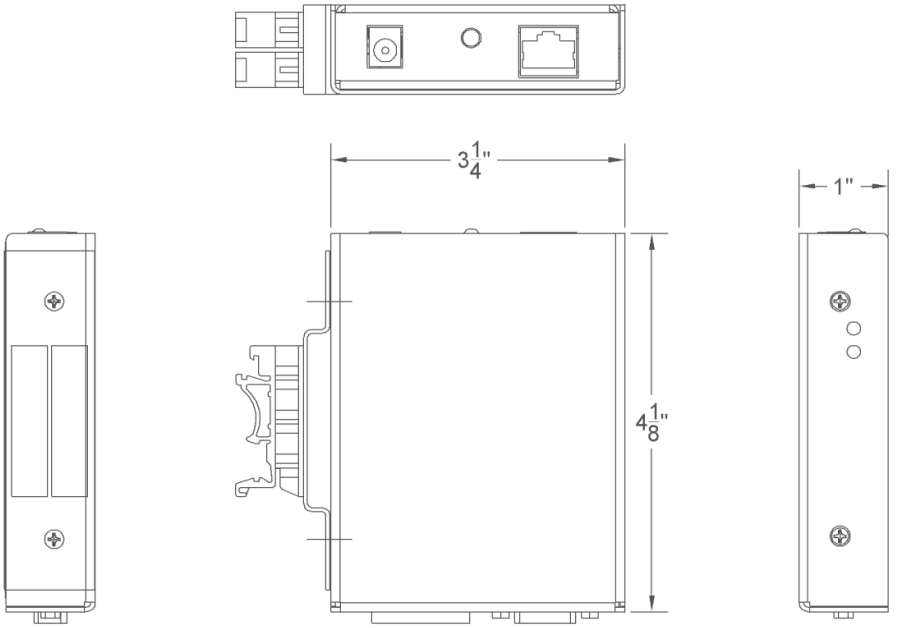
You will also need to verify the following Modbus Slave Settings:

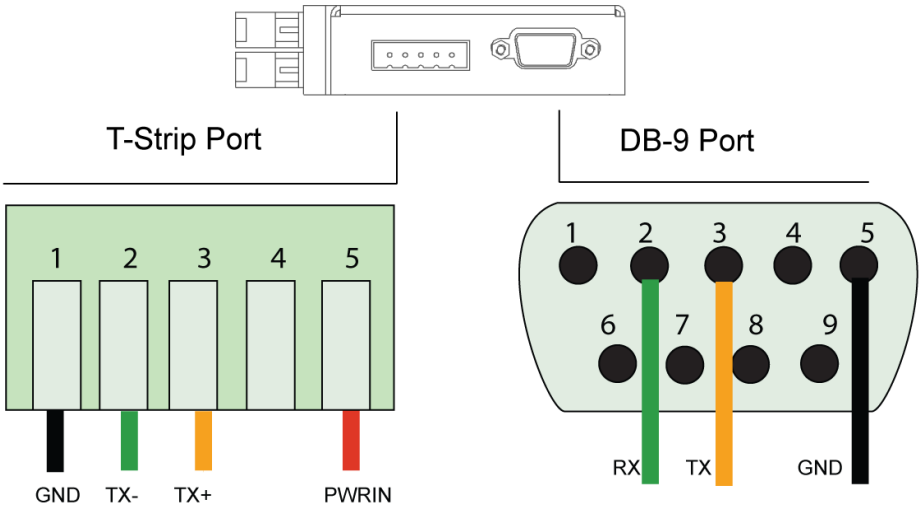
- Data Timeout
- Baud Rate
- Parity
- Data Bits
- Stop Bits

Port Connections (BACnet/IP / Modbus and Ethernet/IP / Modbus)

The factory default port settings on the 460MXE gateway are for Port 0 (T-strip) to be set for RS485 including power (Pin 5). Port 1 (DB9) is set to RS232 by default.

If these default port are not compatible with your equipment they can be configured differently. For specific jumper settings refer to the end of this manual, appendix A. For assistance changing port configurations contact our customer support department.

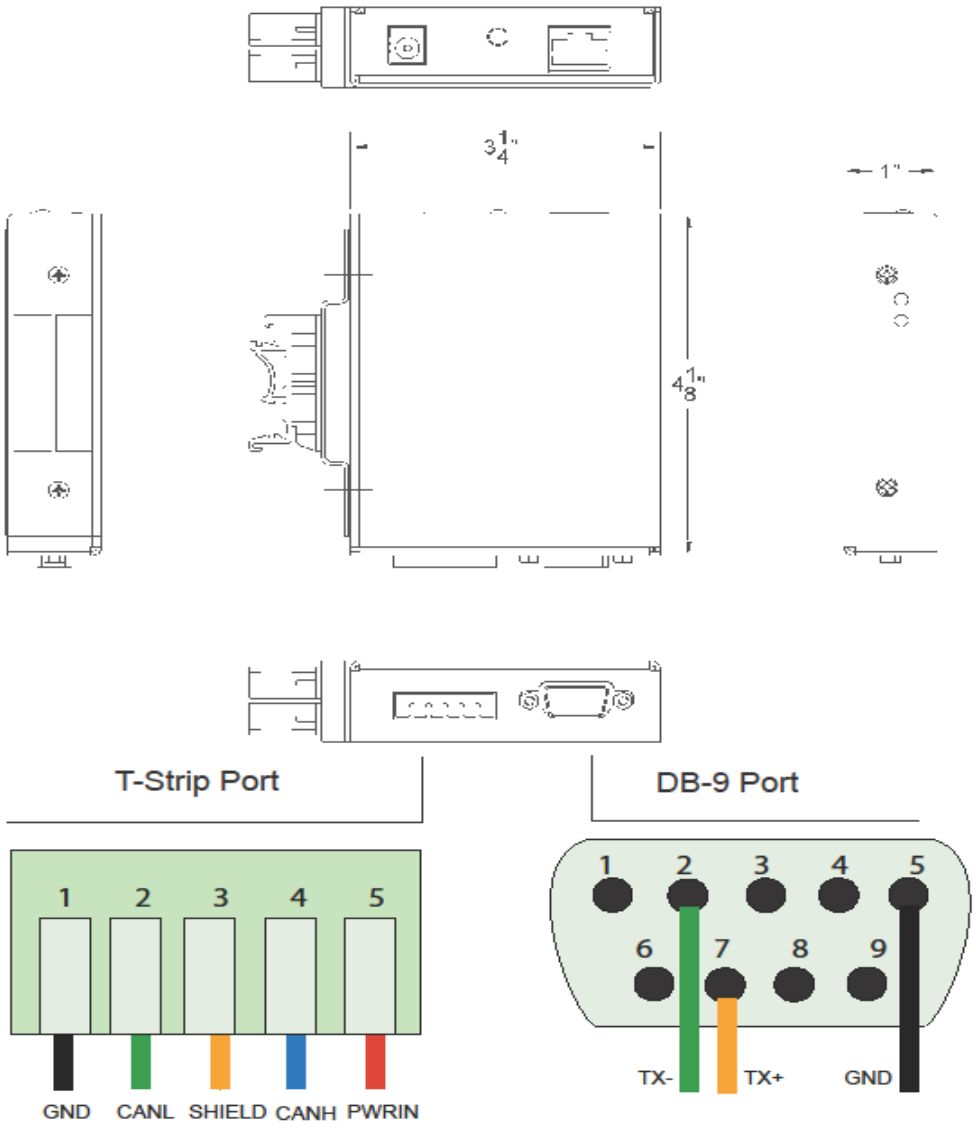




Port Connections (DeviceNet / Modbus)

The factory default port settings on the 460MXE gateway are for Port 0 (T-strip) to be set for CAN while Port 1 (DB9) is set to RS485 by default.

If these default port are not compatible with your equipment they can be configured differently. For specific jumper settings refer to the end of this manual, appendix A. For assistance changing port configurations contact our customer support department.



Accessing the Main Page

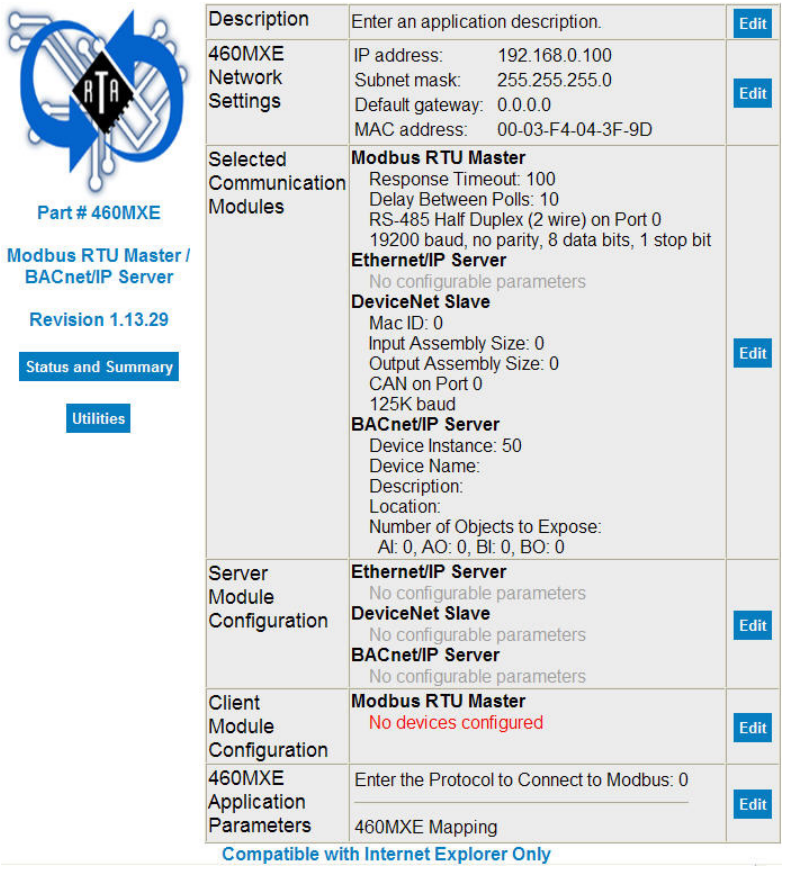
Before you can configure the gateway itself you must configure the network settings to connect the gateway. The following steps will connect the gateway properly.

1) Connect a 7-30 VDC power source to the device.
2) Using the crossover cable (supplied) connect the device to the PC. (NOTE: If you are connecting to the device via a hub or a switch use a standard Ethernet cable.)
3) Insert the provided CD-ROM.
4) Run the IPSetup.exe program from the CD-ROM.
5) Configure the IP address for your subnet.
6) Click Set.
7) Click Launch Webpage. The Main page will appear.

NOTE

Browser configuration is only Internet Explorer compatible. The use of Fire-Fox is not supported.

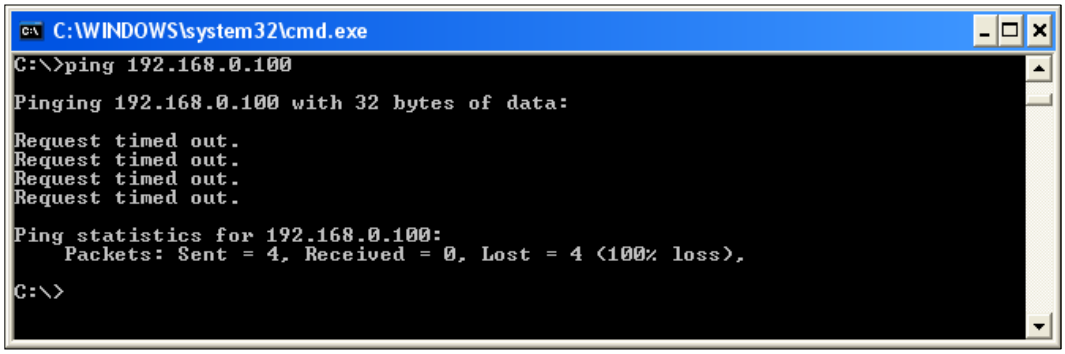
Default IP address is 192.168.0.100

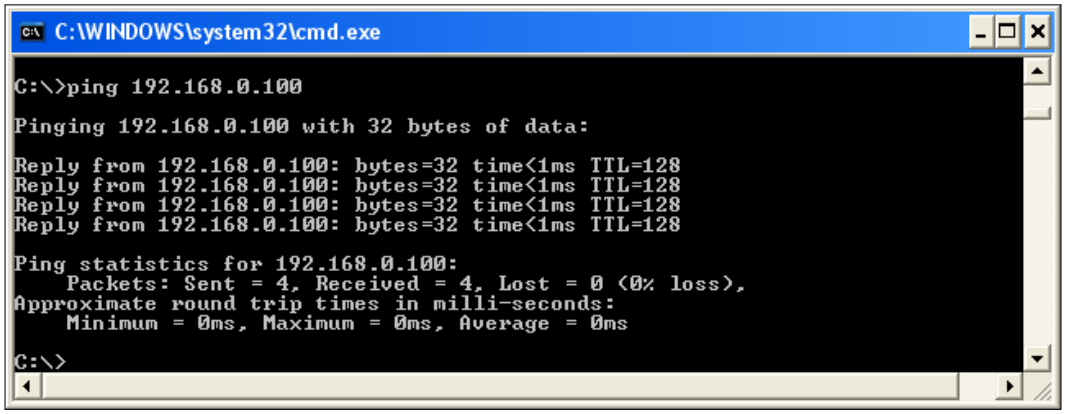


Error: Main Page Does Not Launch

If the Main Page does not launch the IP address is most likely incorrect. Correct the IP address and try again. If you do not know the IP address use the following procedure:

1) Open an MS-DOS Command Prompt.
2) Type ipconfig and press enter.
3) Note the IP address. (The previous example was 192.168.0.1)
4) To test the communication between the PC and the unit, type ping (###.###.###.###) in the prompt and press enter. The (###.###.###.###) is a placeholder for the IP address you used in step 5 of network configuration which was*192.168.0.100*. If the device is connected to the network the ping will show a response. If you get no response check the crossover cable and any other network devices.





Choosing a Protocol

Now that the device is on the network you will need to select what protocol you are connecting to (BACnet/IP or Ethernet/IP or DeviceNet).

1) If you would like to change the device description, on the main page, in the Description row, click Edit. Otherwise, skip to step 4.
2) Type the desired description into the text box.
3) Click Save.
4) From the Main Page, Click the Edit button with the Application Parameters section
5) Enter a 0 to transfer data to BACnet/IP
6) Enter a 1 to transfer data to Ethernet/IP
7) Enter a 2 to transfer data to DeviceNet
8) Click Save

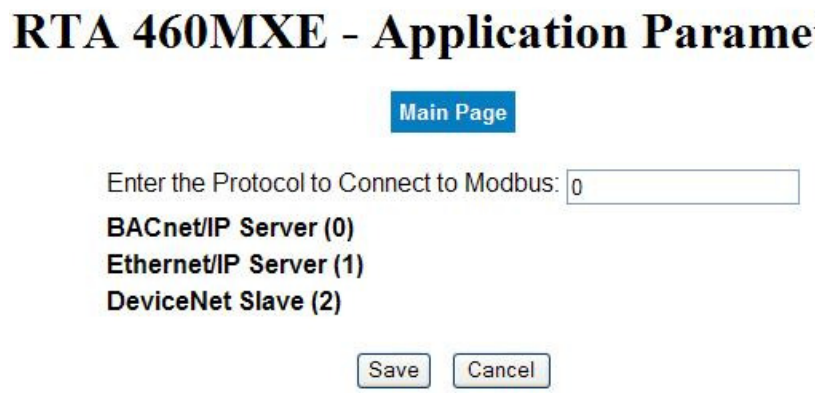
Continue with Page 8 of this document for setting up the Modbus RTU device. Once you have completed page 11, jump to the following pages:

BACnet/IP: Page 12

Ethernet/IP: Page 13

DeviceNet: Page 14

Once each page has been completed, jump to page 15 for finishing the 460MXE setup.



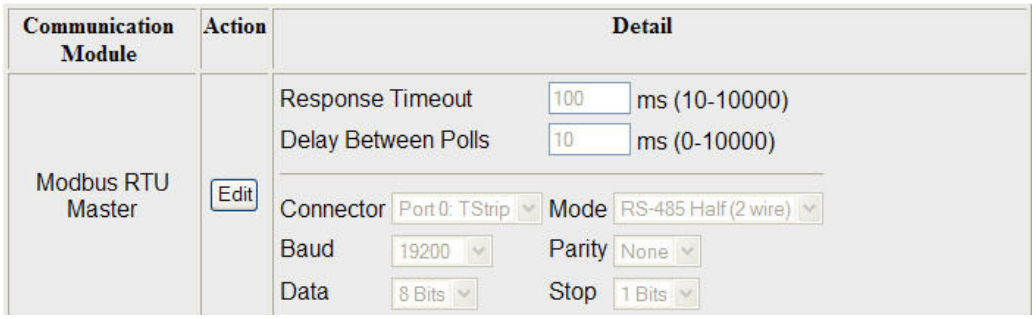
Modbus RTU Master Settings

Now that the device is on the network you will configure the device settings.

As a reminder you will need to know the baud rate, parity, data bits and stop bit settings of your Modbus slave device in order to complete device configuration.

1) If you would like to change the device description, on the main page, in the Description row, click Edit. Otherwise, skip to step 4.
2) Type the desired description into the text box.
3) Click Save.
4) In the Selected Communication Modules row, click Edit.
5) In the Modbus row click Edit.
6) Verify that the Enabled box is checked.
7) Response Timeout is set to 500 ms by default and should suffice for most applications. Delay Between Polls (time between scan line requests) is set to 50 ms by default. These values can be changed to suit your requirements.
8) Select the appropriate settings in the **Connector, Mode, Baud, Parity, Data** and **Stop** fields. The settings should match your Modbus Slave device.

If your data is not flowing correctly after installing the device on the network, check that the settings selected match the settings of your Modbus Slave device. Incorrect settings will skew operation.



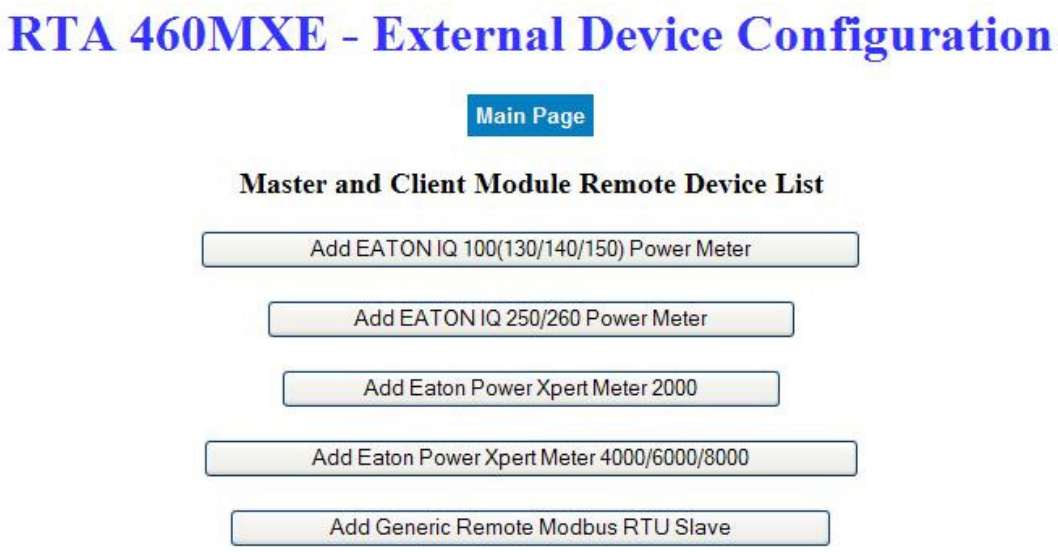
Configuring External Master Modules

1) From the Main page click Edit in the Client Module Configuration row.

2) There are four options for external devices:

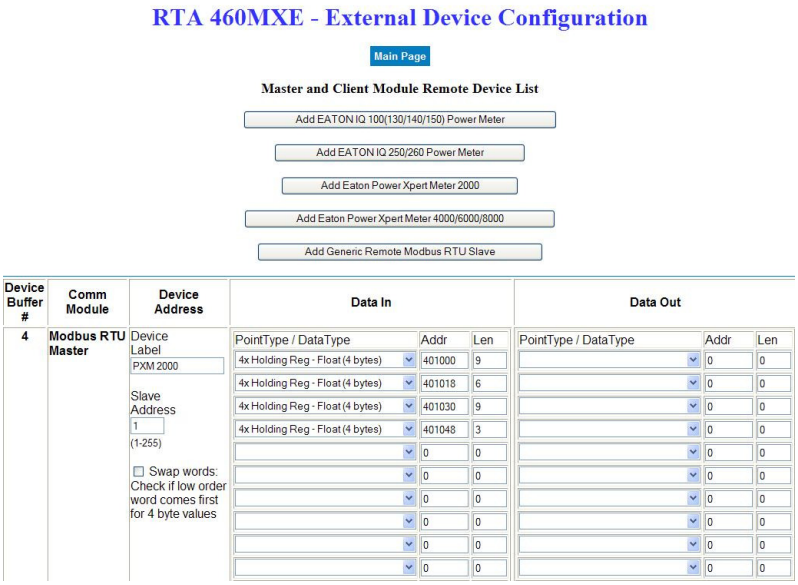
- **Eaton IQ 250/260 Power Meter**
- **Eaton IQ 130, 140, 150**
- **Eaton Power Xpert 2000**
- **Eaton Power Xpert 4000, 6000, 8000**
- **Add Generic Remote Modbus RTU Slave**

(Continued on page 10)


RTA 460MXE - External Device Configuration
Main Page
Master and Client Module Remote Device List
Add EATON IQ 100(130/140/150) Power Meter
Add EATON IQ 250/260 Power Meter
Add Eaton Power Xpert Meter 2000
Add Eaton Power Xpert Meter 4000/6000/8000
Add Generic Remote Modbus RTU Slave

3) Selecting any of the first four devices will install the device with preset **Data In** settings. The device **Slave address** and **Data Out** parameters will still need to be configured.

4) To add a generic Modbus slave device click on the **Add Generic Remote Modbus Slave Device** button.



5) Enter a name for the device in the Device Label field to help distinguish between multiple devices.

6) In the Slave address enter the address that corresponds to your Modbus Slave Device.

7) If you need to change the read order for values that are 4 bytes check the box labeled Swap Words.

Example:

With the value 302.25 mapped as a floating value.

When Swap Words is enabled	When Swap Words is not enabled
1st reg. = 0x2000	1st reg. = 0x4397
2nd reg. = 0x4397	2nd reg. = 0x2000

Scan List Settings

1) Data in values are values received from the Modbus slave device which are considered inputs to BACnet.

2) Data out values are the values sent from the BACnet device to the Modbus slave.

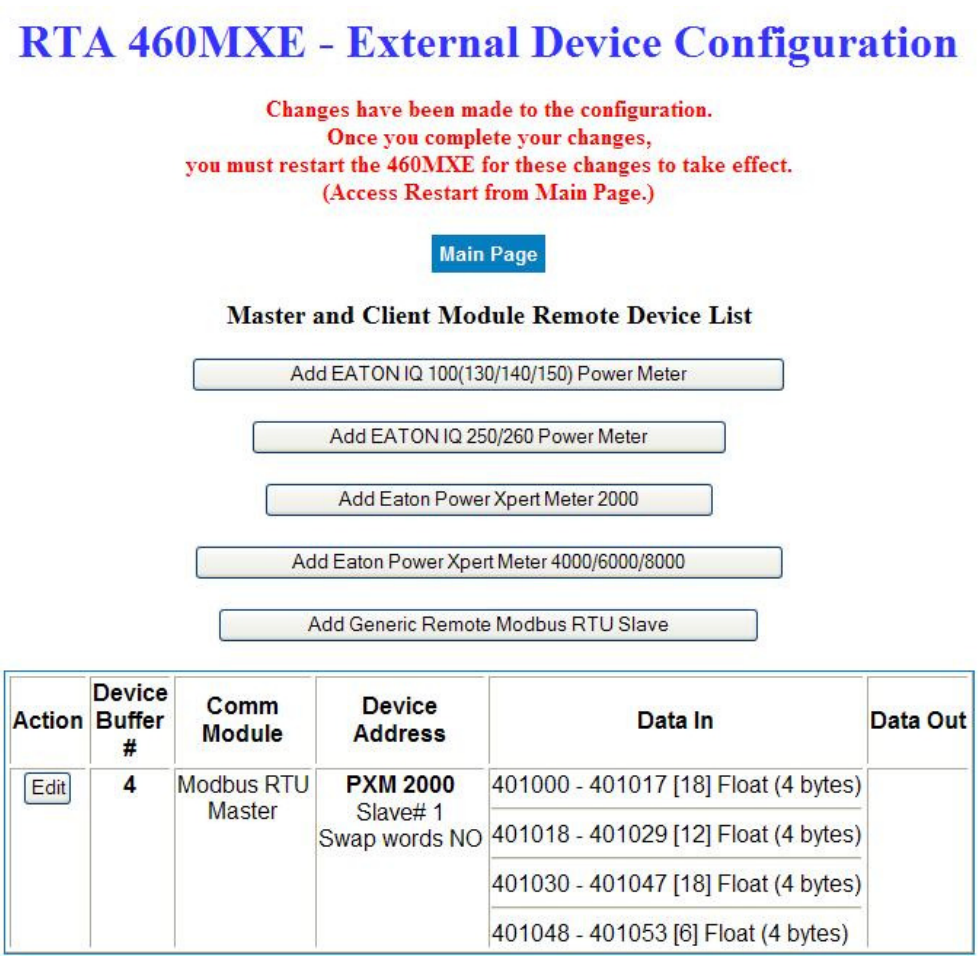
3) The Point Type/Data Type values will match those of the Modbus slave device.

4) Length is the number of data types to be read. (It is not the number of registers)

5) Click Save.

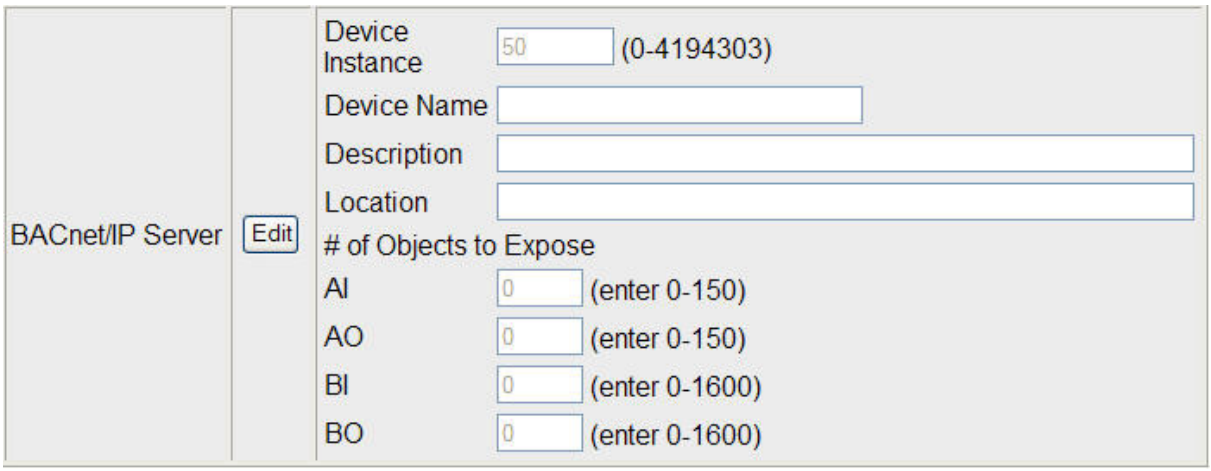
6) A summary of the configured data will be displayed along with instructions in red to restart the device to save your changes. Click Restart.

7) A confirmation box will appear, click Restart Now. You will be redirected to the main page.


RTA 460MXE - External Device Configuration
Changes have been made to the configuration.
Once you complete your changes,
you must restart the 460MXE for these changes to take effect.
(Access Restart from Main Page.)
Main Page
Master and Client Module Remote Device List
Add EATON IQ 100(130/140/150) Power Meter
Add EATON IQ 250/260 Power Meter
Add Eaton Power Xpert Meter 2000
Add Eaton Power Xpert Meter 4000/6000/8000
Add Generic Remote Modbus RTU Slave
Action
Device Buffer #
Comm Module
Device Address
Data In
Data Out
Edit
4
Modbus RTU Master
PXM 2000
Slave# 1
Swap words NO
401000 - 401017 [18] Float (4 bytes)
401018 - 401029 [12] Float (4 bytes)
401030 - 401047 [18] Float (4 bytes)
401048 - 401053 [6] Float (4 bytes)

BACnet IP Server Settings

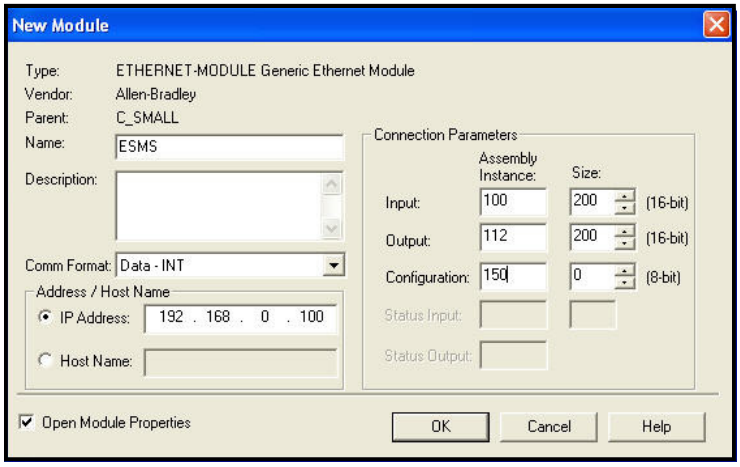
1) Scroll down to the BACnet Server row and click Edit. Verify that the Enabled box is checked.
2) Enter the Device Instance that corresponds with your Modbus Slave device/s.
3) In the Device Name field enter a unique name for the device.
4) The Description and Locations fields are optional. Filling in the fields is recommended to identify the device on a network.
5) Beneath # of Objects to Expose, values should all be kept as zero. These values are dynamically determined by the runtime of the Modbus slave scan list.
6) Click Save.
7) Click Return to Main Page.

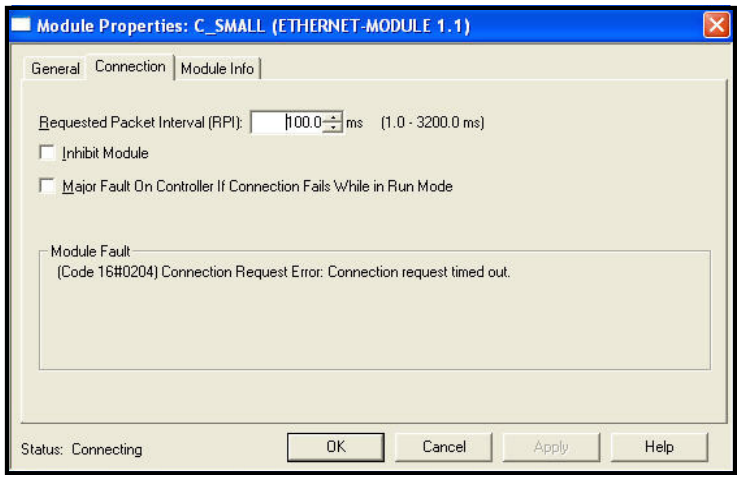


Ethernet/IP Server

1) For the Data Out column do the same as Step 8 except use the correct Output Instance Number, Length in bytes, and Required Pack Interval in milliseconds.

2) Click **Save** when configuration is complete. You must restart the 460 device in order for the data to be updated.

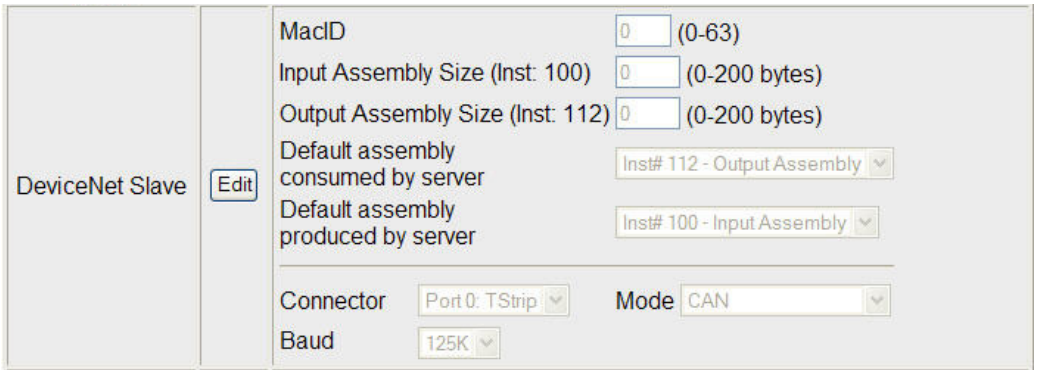




DeviceNet Slave Settings

Now that the device is on the network, you will configure the device settings. As a reminder, you will need to know the mode, baud rate, parity, data and stop bit settings of your device in order to complete device configuration.

1) If you would like to change the device description, on the main page, in the Description row, click **Edit**. Otherwise, skip to step 4.
2) Type the desired description into the text box.
3) Click **Save**.
4) In the Selected Communication Modules row, click **Edit**.
5) In the DeviceNet Master row, click **Edit**.
6) Enter the device's corresponding Mac ID.
7) Enter the number of Bytes for Input Instance 100
8) Enter the number of Bytes for Output Instance 112
9) Select the port type to use. (Port 0: T-strip)
10) Select the corresponding baud rate. (125K, 250K, 500K)
11) Click **Save**.
12) Click **Return to Main Page**.



Application Parameters

1) Next Application Parameters click **Edit.**

2) 460MXE Mapping will display the connection between the tags / file names in your PLC to the BACnet/IP Object within your Client.

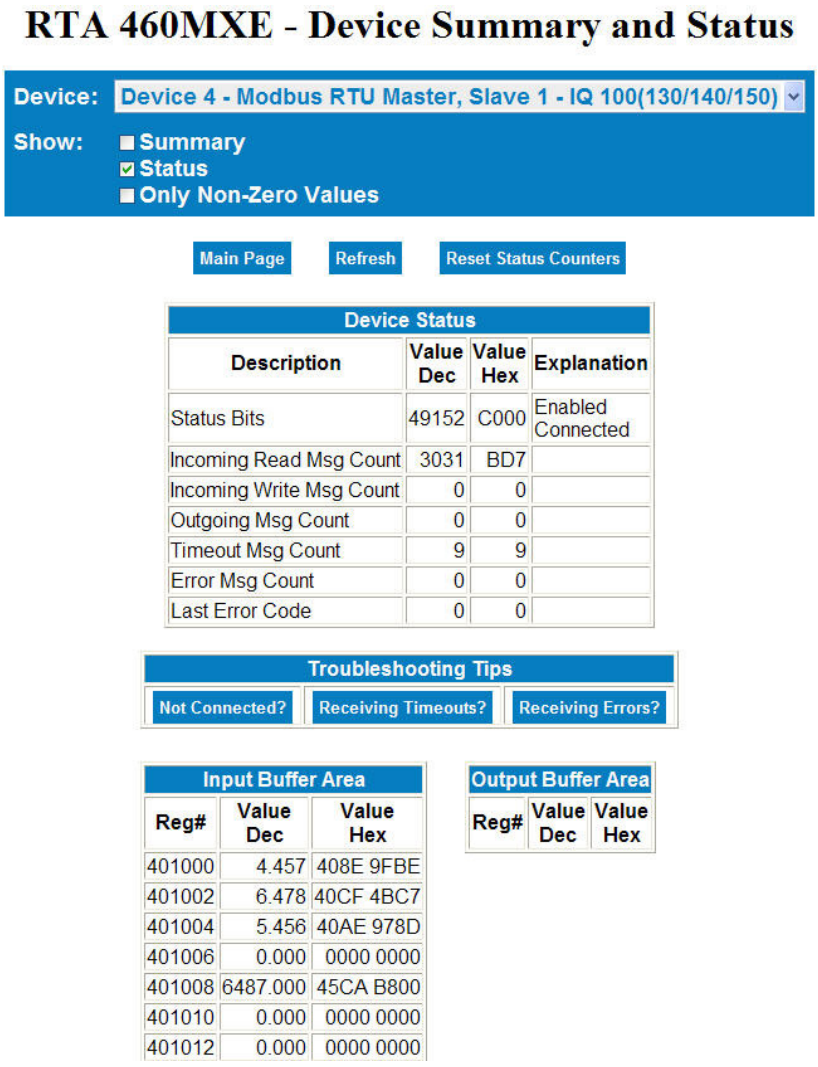
460MXE Mapping

Modbus to BACnet	
Modbus Register/Coil	BACnet Object
BACnet to Modbus	
BACnet Object	Modbus Register/Coil

Save Cancel

Verifying Application Parameters

1) On the Main Page click on the Status and Summary button located on the left hand side of the screen.
2) The 460MXE Device Summary and Status page will be shown.
3) The device drop down menu allows you to switch between the different devices and display their status.
4) Under Show you can choose to show only values that are greater than zero. Summary can be left unchecked as that feature has not been implemented yet.
5) The Device Summary and Status section displays whether or not the device is connected and enabled.



RTA 460MXE - Device Summary and Status

Device: Device 4 - Modbus RTU Master, Slave 1 - IQ 100(130/140/150)

Show: ☐ Summary ☑ Status ☐ Only Non-Zero Values

Main Page | Refresh | Reset Status Counters

Device Status

Description	Value Dec	Value Hex	Explanation
Status Bits	49152	C000	Enabled Connected
Incoming Read Msg Count	3031	BD7	
Incoming Write Msg Count	0	0	
Outgoing Msg Count	0	0	
Timeout Msg Count	9	9	
Error Msg Count	0	0	
Last Error Code	0	0	

Troubleshooting Tips

Not Connected? | Receiving Timeouts? | Receiving Errors?

Input Buffer Area

Reg#	Value Dec	Value Hex
401000	4.457	408E 9FBE
401002	6.478	40CF 4BC7
401004	5.456	40AE 978D
401006	0.000	0000 0000
401008	6487.000	45CA B800
401010	0.000	0000 0000
401012	0.000	0000 0000

Output Buffer Area

Reg#	Value Dec	Value Hex

Validating Gateway Communication

If the Timeout counter or the Error counter are incrementing or a status of Enabled Not Connected, refer to the Troubleshooting Tops to help get the device up and running.

RTA 460MXE - Device Summary and Status

Device: Device 3 - Local BACnet/IP Server

Show:
- ☐ Summary
- ☑ Status
- ☐ Only Non-Zero Values

Main Page | Refresh | Reset Status Counters

Device Status

Description	Value Dec	Value Hex	Explanation
Status Bits	32768	8000	Enabled NOT Connected
Incoming Read Msg Count	0	0	
Incoming Write Msg Count	0	0	
Outgoing Msg Count	0	0	
Timeout Msg Count	0	0	
Error Msg Count	0	0	
Last Error Code	0	0	

BACnet Server objects

Object Code	Name	Units	Value	Source		
				Device	Register	Precisio
AI 1	Volts A-N	volts (5)	4.457000	Device 4, Slave 1 - IQ 100(130/140/150)	401000	Value X 1.00000
AI 2	Volts B-N	volts (5)	6.478000	Device 4, Slave 1 - IQ 100(130/140/150)	401002	Value X 1.00000
AI 3	Volts C-N	volts (5)	5.456000	Device 4, Slave 1 - IQ 100(130/140/150)	401004	Value X 1.00000
AI 4	Volts A-B	volts (5)	0.000000	Device 4, Slave 1 - IQ 100(130/140/150)	401006	Value X 1.00000
AI 5	Volts B-C	volts (5)	6487.000000	Device 4, Slave 1 - IQ 100(130/140/150)	401008	Value X 1.00000
AI 6	Volts C-A	volts (5)	0.000000	Device 4, Slave 1 - IQ 100(130/140/150)	401010	Value X 1.00000

Configuring Multiple Devices

If you are configuring multiple devices the same way, you can repeat the configuration by saving your work into a file. To do so, follow these steps.

1) From the Main Page, click the Utilities button.
2) Click Save Configuration to File.
3) Click Save.
4) Browse to the location you want to save the file.
5) Click OK.
6) Remove the first device.
7) Repeat the network configuration section to connect the next device.
8) Once you launch the webpage, click the Utilities button.
9) Click Browse… and navigate to the file you previously saved.
10) Click Open.
11) Click Restore from File.

Completing the Installation

Now that the 460MXE gateway is configured properly you must place the device in the network. The following instructions will tell you how to take the device from the configuration area to the shop floor or other operating environment.

1) Disconnect the crossover cable and power supply from the device.
2) Move the device to its intended location.
3) For Bacnet/IP or Ethernet/IP, follow steps 4-6. For DeviceNet, skip to step 7.
4) Attach the Ethernet cable from the BACnet/IP Client / Ethernet/IP Client to the network port on the 460MXE Gateway.
5) Attach the Modbus RTU serial cable to Port 0 (T-strip) or Port 1 (DB-9) of the 460MXE Gateway.
6) Connect the 7-30 VDC power source to the device via the T-strip.
7) Attach the Modbus connection from the Modbus RTU Slave/s to the port Port 1 (DB9) of the 460MMDS.
8) Attach the T-Strip connection from the DeviceNet Master device to Port 0 (T-Strip) of the 460MMDS Gateway.
9) Connect the 7-30 VDC power source to the device via the T-strip.

Jumper Configurations

To change port settings on the 460 EDX Gateway use the following steps:

1) No cables should be connected to the Gateway unit. If this unit has been in use and you are making a change, disconnect the power cable and any communications cables from the Gateway unit.

2) Remove the two small Phillips-head screws from each long side of the Gateway unit.

3) Remove the green T-Strip connector. Slide the cover off towards the ports. The jumpers are just behind the ports.

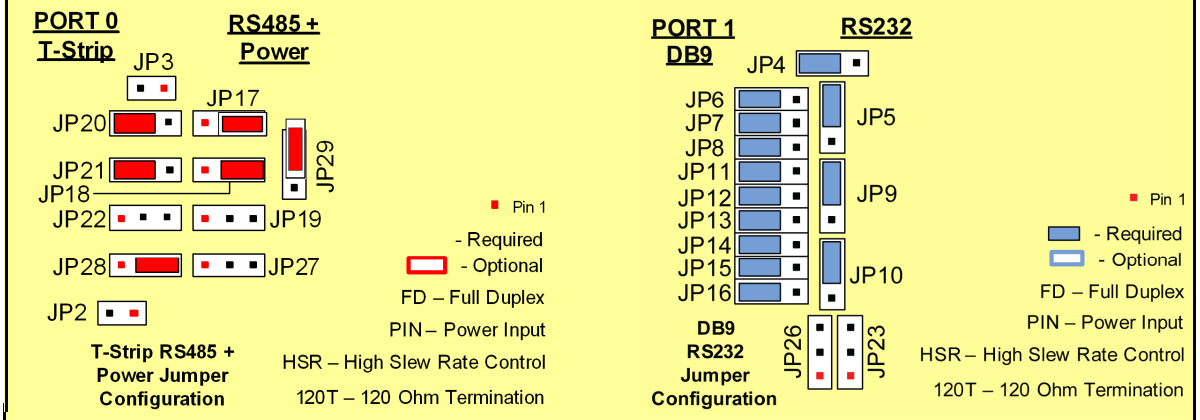
4) Move the jumper shunts to reflect the desired settings.

5) Replace the Gateway unit's cover. Replace the four screws. Replace the green T-Strip5 connector.

Only one RS232, RS485, or CAN port setting can be active at a time for each unit. For example, a unit cannot have two ports set for RS232 or two ports set for CAN.

Configuration 1

NC=No connection

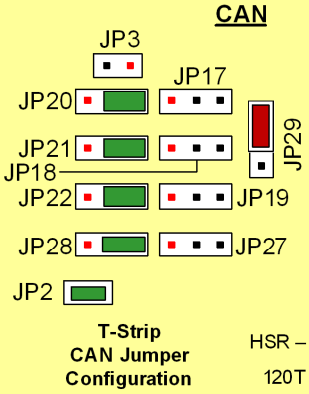


Port 0 (T-Strip) RS485 & PWR	**1**	**2**	**3**	**4**	**5**				
Pin Setting	**GND**	**TX-**	**TX+**	**NC**	**PWR**				
Port 1 (DB-9) RS232	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Pin Setting	**NC**	**RX**	**TX**	**NC**	**GND**	**NC**	**NC**	**NC**	**NC**

Configuration 2

NC= No connection

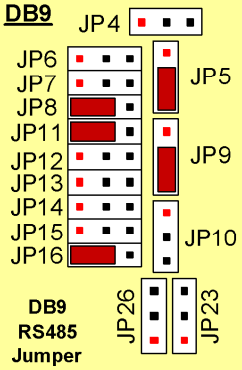
CAN



T-Strip CAN Jumper Configuration

Pin 1
- Required
- Optional
FD – Full Duplex
PIN – Power Input
HSR – High Slew Rate Control
120T – 120 Ohm Termination

PORT 1 DB9 **RS485**



DB9 RS485 Jumper Configuration

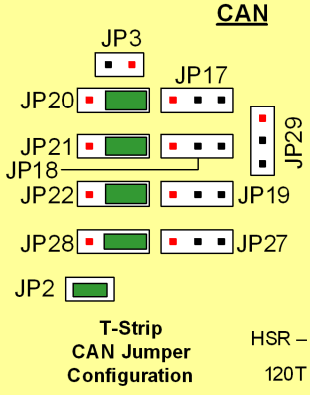
Pin 1
- Required
- Optional
FD – Full Duplex
PIN – Power Input
HSR – High Slew Rate Control
120T – 120 Ohm Termination

Port 0 (T-Strip) CAN	1	2	3	4	5				
Pin Setting	GND	CANL	SHIELD	CANH	PWR				
Port 1 (DB-9) RS485	1	2	3	4	5	6	7	8	9
Pin Setting	NC	TX-	NC	NC	GND	NC	TX+	NC	NC

Configuration 3

NC= No connection

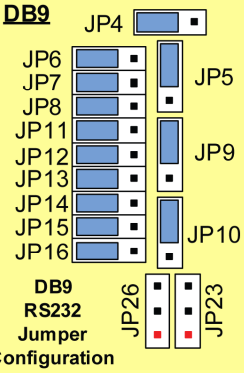
CAN



T-Strip CAN Jumper Configuration

Pin 1
- Required
- Optional
FD – Full Duplex
PIN – Power Input
HSR – High Slew Rate Control
120T – 120 Ohm Termination

PORT 1 DB9 **RS232**



DB9 RS232 Jumper Configuration

Pin 1
- Required
- Optional
FD – Full Duplex
PIN – Power Input
HSR – High Slew Rate Control
120T – 120 Ohm Termination

Port 0 (T-Strip) CAN	1	2	3	4	5				
Pin Setting	GND	CANL	SHIELD	CANH	PWR				
Port 1 (DB-9) RS232	1	2	3	4	5	6	7	8	9
Pin Setting	NC	RX	TX	NC	GND	NC	NC	NC	NC

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